



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,615	05/28/2002	Ravi Chandran	2376.2115-004	7963
57690	7590	07/07/2008		
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.				
530 VIRGINIA ROAD				
P.O. BOX 9133				
CONCORD, MA 01742-9133				
EXAMINER				
WOZNIAK, JAMES S				
ART UNIT		PAPER NUMBER		
2626				
MAIL DATE		DELIVERY MODE		
07/07/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/019,615

Applicant(s)

CHANDRAN ET AL.

Examiner

JAMES S. WOZNIAK

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 and 28-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/808)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the office action from 10/12/2007, the applicant has submitted an amendment, filed 4/15/2008, amending independent claims 1, 32, and 62, while arguing to traverse the art rejection based on the amended limitation regarding a calculated echo likelihood estimate (*Amendment, Pages 19-20*). Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments.
2. In response to amended Figs. 1-8, the examiner has withdrawn the previous drawing objections.
3. In response to amended claims 33-56, the examiner has withdrawn the previous objections directed to minor informalities.
4. In response to the amended claim 1, the examiner has withdrawn the previous 35 U.S.C. 112, first paragraph rejection.

Response to Arguments

5. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to the independent claims, the applicants argue that Rabipour et al (*U.S. Patent: 6,011,846*) fails to teach replacing audio signal parameters in response to an echo likelihood estimate because Rabipour relies on an echo energy instead (*Amendment, Pages 19-20*).

In response, the examiner notes that Rabipour's echo estimating technique anticipates the broadly claimed "echo estimate". The examiner alluded to this instance in the previous Office Action (*Pages 5-6*). It was suggested that the claims be amended to incorporate the calculation itself and how specifically the calculated result is used to adjust a speech parameter, however, the amended claims generally state that an echo likelihood is determined. As such, these amendments do not overcome the teachings of the prior art of record because Rabipour teaches that his echo compensation is adaptive to an echo presence certainty (*Col. 5, Line 35- Col. 6, Line 16*). Although Rabipour's value may be calculated differently from the likelihood recited in the present specification (*i.e., different equations/variables are used*), Rabipour's echo calculation supplies an echo compensation means with a "certainty" (*i.e., likelihood*) of the presence of an echo in an encoded speech signal. Thus, Rabipour teaches the aforementioned claim limitation.

The art rejection of claims 26, 28-31, and 57-61 is traversed for reasons similar to the independent claims due to their noted dependency (*Page 21*). In response, the examiner notes

that the aforementioned claims are part of independent claim sets, which do not contain the added limitations of independent claims 1 and 32. As such, the applicant's arguments are moot with respect to these claims and the previous rejection is maintained below.

The art rejection of the dependent claims is traversed for reasons similar to the independent claims (*Amendment, Pages 20-21*). In regards to such arguments, see the response directed towards the independent claims.

Requirement for Information

6. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

In response to this requirement, please provide copies of each publication which any of the applicants authored or co-authored and which describe the disclosed subject matter of the present claimed invention, specifically the following reference:

R. Chandran, ***Coded Domain Enhancement of Compressed Speech***,
Master's Thesis, University of Notre Dame, 1999.

This paper was known to the inventors as per their "Compressed Domain Noise Reduction and Echo Suppression for Network Speech Enhancement" reference (*see Page 13, reference section, item 4*) (*see PTO-892*), deals with subject matter similar to that recited in the present disclosure (*as per its title and inclusion in a publication directed to similar subject matter*), and was authored by one of the present inventors, thus, its submission is required.

This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. **Claims 2-7, 16-18, and 22-25** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The dependent claims recite a multitude of processes that seem to be associated with a various claim 1 elements, but are noted as being performed by a processor (which lacks antecedent basis). It is uncertain whether these functions are actually performed by a processor or one of the elements of claim 1. Based on the independent claims, these associated steps are assumed to not be associated with a processor, and the claims will be interpreted thusly for the application of the prior art of record.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. **Claims 1-4, 7, 12, 15-16, 18-19, 21-22, 32-35, 38, 43, 47, 50, 52-53, and 62** are rejected under 35 U.S.C. 102(e) as being anticipated by Rabipour et al (*U.S. Patent: 6,011,846*).

With respect to **Claims 1 and 32**, Rabipour discloses:

A reading unit responsive to the near end digital signal to read at least said first parameter of said plurality of parameters and a decoder to perform at least one of said plurality of decoding steps on the near end digital signal and the far end digital signal to generate at least partially decoded near end signals and at least partially decoded far end signals (*means for receiving/reading and extracting speech parameters from near and far end encoded speech signals, Col. 3, Line 48- Col. 4, Line 22*); and

Responsive to said at least partially decoded near end signals and at least partially decoded far end signals, an adjustment unit to adjust the first parameter to generate an adjusted first parameter (*adjusting near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16*).

An echo likelihood estimator to estimate the echo in said near end signal (*echo presence certainty determination, Col. 5, Line 35- Col. 6, Line 16*);

Responsive to said echo estimate, a replacement unit to replace said first parameter with the adjusted first parameter in the near end digital signal (*means for replacing received speech parameters with echo adjusted near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16*); and

A transmitter to transmit said near end digital signal with reduced echo (*performing echo suppression in a telecommunication network that would inherently require some type of transmitter to send echo adjusted speech to a caller, Col. 3, Lines 1-10 and 33-43; and Fig. 1).*

With respect to **Claims 2 and 33**, Rabipour discloses:

The first parameter is a quantized first parameter and wherein said processor generates said adjusted first parameter in part by quantizing said adjusted first parameter before writing said adjusted first parameter into said near end digital signal (*replacing speech parameters with adjusted speech parameters after quantization, Col. 6, Line 40- Col. 7, Line 32).*

With respect to **Claims 3 and 34**, Rabipour discloses:

The processor is responsive to the at least partially decoded near end signals and the at least partially decoded far end signals to generate an echo likelihood signal representing the amount of echo present in the partially decoded near end signals, and wherein the processor is responsive to the echo likelihood signal to adjust the first parameter (*Echo compensation adaptive to an echo presence certainty, Col. 5, Line 35- Col. 6, Line 16).*

With respect to **Claims 4 and 35**, Rabipour recites:

Characteristics comprise spectral shape (*near and far end spectrum, Col. 3, Line 48- Col. 4, Line 22*) and wherein said first parameter comprises a representation of filter coefficients (*LPC coefficients including excitation parameters, Col. 6, Lines 20-31*), and wherein said processor is responsive to said echo likelihood signal to adjust said representation of filter coefficients towards a magnitude frequency response (*modifying LPC coefficients based on a modified impulse response, Col. 6, Line 20- Col. 7, Line 32).*

With respect to **Claims 7 and 38**, Rabipour recites:

The magnitude frequency response corresponds to background noise (*correction factor determined using an impulse response for updated LPC parameters corresponding to background noise, Col. 7, Lines 11-62*).

Claims 12 and 43 contains subject matter similar to Claims 4 and 35, and thus, is rejected for similar reasons.

With respect to **Claim 15**, Rabipour discloses LPC coefficients including excitation parameters (*Col. 6, Lines 20-31*).

With respect to **Claims 16 and 47**, Rabipour discloses partial decoding for extracting speech parameters, which avoids synthesis processing (*Col. 1, Line 52- Col. 3, Line 10*).

With respect to **Claim 18**, Rabipour discloses:

The at least one decoding step comprises post filtering (*synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10*).

With respect to **Claims 19 and 50**, Rabipour discloses the use of LPC-based speech compression (*Col. 1, Lines 48-51*).

With respect to **Claims 21 and 52**, Rabipour discloses the use of CELP compression (*Col. 8, Lines 8-11*).

With respect to **Claims 22 and 53**, Rabipour discloses averaging a set of near and far end LPC parameters to determine a degree of echo compensation (*Col. 3, Line 48- Col. 4, Line 22*).

With respect to **Claim 62**, Rabipour discloses:

A near end partial decoder to at least partially decode coded near end digital signals, including at least a first parameter of a plurality of parameters representing respective near end

Art Unit: 2626

audio signals in the coded near end digital signals to form at least partially decoded near end signals (*decoder that extracts speech parameters from a near-end signal, Col. 3, Lines 48-54*);

A far end partial decoder to at least partially decode coded far end digital signals, including at least a first parameter of a plurality of parameters representing respective far end audio signals in the coded far end digital signals to form at least partially decoded far end signals (*decoder that extracts speech parameters from a far-end signal, Col. 3, Lines 48-54*);

A processor responsive to said near end digital signals to read at least said first parameter of first said plurality of parameters in the coded near end digital signals and at least partially decode said near end digital signal and to read a coded far end digital signal to generate at least partially decoded far end signals and at least partially decoded far end signals (*Col. 3, Line 48-Col. 4, Line 22*), and responsive to at least said partially decoded near end signals and at least partially decoded far end signals to adjust said first parameter to generate an adjusted first parameter and to replace at least said first parameter with said adjusted first parameter in said near end digital signal to reduce echo in the near end digital signal (*processor for adjusting near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16*).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 5-6, 13-14, and 36-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Strawczynski et al (*U.S. Patent: 6,138,022*).

With respect to **Claims 5, 14, and 36**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour does not teach the use of line spectral frequencies (*LSFs*), however Strawczynski teaches the use of such LSF coefficients (*Col. 3, Lines 24-34*).

Rabipour and Strawczynski are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the LSF coefficients taught by Strawczynski in order to provide speech coefficients that uniquely define a human articulatory tract, which are suited to a number of different applications (*Strawczynski, Col. 3, Lines 24-34*).

With respect to **Claims 6, 13, and 37**, Strawczynski additionally recites the use of log area ratio coefficients (*Col. 3, Lines 24-34*).

13. **Claims 8-9 and 39-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Gritton et al (*U.S. Patent: 5,857,167*).

With respect to **Claims 8 and 39**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour also discloses LPC coefficients related to an energy level (*Col. 5, Line 45- Col. 6, Line 16*). Rabipour does not specifically suggest the use of a codebook gain, however Gritton teaches the use of such a gain parameter (*Col. 6, Lines 55-65*).

Rabipour and Gritton are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the gain codebook parameters taught by Gritton in order to provide a means for compensating for an error between original and synthesized speech (*Col. 4, Lines 31-67*).

With respect to **Claims 9 and 40**, Gritton teaches the codebook gain as applied to Claim 8.

14. **Claims 10-11, 20, 23-25, 41, 42, 46, 49, 51, and 54-56** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen (U.S. Patent: 5,651,091).

With respect to **Claims 10 and 41**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour does not specifically suggest the use of long-term predictor and pitch period parameters, however Chen discloses the use of such parameters (*Col. 4, Lines 3-44*).

Rabipour and Chen are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the long-term predictor and pitch period parameters taught by Chen in order to provide parameters that exploit the pitch periodicity in voiced speech (*Chen, Col. 4, Lines 29-31*) and impose lesser demands upon echo suppressors (*Chen, Col. 1, Lines 38-48*).

With respect to **Claims 11 and 42**, Chen further recites the use of a long-term pitch predictor and an associated pitch gain (*Col. 3, Lines 14-25*).

With respect to **Claims 20 and 51**, Chen discloses the long-term predictor coding as applied to Claim 11.

With respect to **Claims 23 and 54**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing (*Col. 5, Lines 5-8*).

With respect to **Claims 24 and 55**, Rabipour teaches completing echo suppression for a frame before advancing to a next frame as shown in Figs. 2C and 3, while Chen discloses the subframe based processing as applied to Claim 23.

With respect to **Claims 25 and 56**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters for each speech frame according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing (*Col. 5, Lines 5-8*).

With respect to **Claim 46**, Rabipour further discloses LPC coefficients including excitation parameters (*Col. 6, Lines 20-31*).

With respect to **Claim 49**, Rabipour further discloses:

The at least one decoding step comprises post filtering (*synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10*).

15. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Christensson et al (*U.S. Patent: 6,510,224*).

With respect to **Claim 17**, Rabipour discloses the echo suppression system and method utilizing spectrum coefficients, as applied to Claims 1 and 12. Rabipour does not specifically

suggest the use of power parameters, however Christensson teaches the use of such parameters (*Col. 6, Line 40- Col. 7, Line 8*).

Rabipour and Christensson are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the use of power parameters in echo suppression as taught by Christensson in order to achieve improved echo suppression performance based on a power parameter and focused on frequency bands where an echo component could easily be mistaken for near end speech (*Christensson, Col. 7, Lines 1-8*).

16. **Claims 26, 28-31, and 57-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of the Applicants' Admitted Prior Art (*AAPA*).

With respect to **Claims 26 and 57**, Rabipour discloses:

A processor responsive to the near end digital signal and the far end digital signal to adjust the first and second bits (*LPC compressed speech data bit stream adjusted based on near and far end speech data, Col. 3, Lines 1-10; Col. 3, Line 48- Col. 4, Line 22; Col. 5, Line 35- Col. 7, Line 32*); and

A transmitter to transmit the first and second bits in an adjusted state to a far end device to present the first and second bits in an audible form to a user (*performing echo suppression in a telecommunication network that would inherently require some type of transmitter to send echo adjusted speech to a caller, Col. 3, Lines 1-10 and 33-43; and Fig. 1*).

Although Rabipour discloses adjusting bits directed to LPC compression code, Rabipour

does not specifically suggest the combination of a compression code and a linear code to express a speech signal, such a coding scheme, however, is well known in the prior art as is evidenced by the AAPA. The AAPA recites a TFO GSM standard using a combination of coded speech and PCM bits (*Page 2, Line 11- Page 3, Line 11; and Fig. 3*).

Rabipour and the AAPA are analogous art because they are from a similar field of endeavor in speech compression. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the TFO GSM standard recited in the AAPA in order to expand Rabipour's echo cancellation for use in well-known cellular networks (*AAPA, Page 2, Lines 17-19*).

With respect to **Claims 28 and 58**, the AAPA further recites the use of PCM code (*Page 2, Line 7- Page 3, Line 11*).

With respect to **Claims 29 and 59**, the AAPA recites the TFO GSM standard as applied to Claims 26 and 57.

With respect to **Claims 30 and 60**, the AAPA further recites first bits comprising the two LSBs and second bits comprising 6 MSBs (*Page 3, Lines 3-11; and Fig. 3*).

With respect to **Claims 31 and 61**, the AAPA further recites the use of PCM code for the 6 MSBs (*Page 2, Line 7- Page 3, Line 11; and Fig. 3*).

17. **Claims 44-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen, and further in view of Strawczynski et al.

With respect to **Claim 44**, Rabipour in view of Chen discloses the echo suppression system and method utilizing speech coefficients comprising a long-term pitch predictor and an

associated pitch gain, as applied to Claim 42. Rabipour in view of Chen does not teach the use of log area ratios (*LARs*), however Strawczynski teaches the use of such *LAR* coefficients (*Col. 3, Lines 24-34*).

Rabipour, Chen, and Strawczynski are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the *LAR* coefficients taught by Strawczynski in order to provide speech coefficients that uniquely define a human articulatory tract, which are suited to a number of different applications (*Strawczynski, Col. 3, Lines 24-34*).

With respect to **Claim 45**, Strawczynski teaches the use of such *LSF* coefficients (*Col. 3, Lines 24-34*).

18. **Claim 48** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen, and further in view of Christensson et al.

With respect to **Claim 48**, Rabipour in view of Chen discloses the echo suppression system and method utilizing *LPC* coefficients, as applied to Claim 46. Rabipour in view of Chen does not specifically suggest the use of power parameters, however Christensson teaches the use of such parameters (*Col. 6, Line 40- Col. 7, Line 8*).

Rabipour, Chen, and Christensson are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the use of power parameters in echo suppression as taught by Christensson in order to achieve

Art Unit: 2626

improved echo suppression performance based on a power parameter and focused on frequency bands where an echo component could easily be mistaken for near end speech (*Christensson, Col. 7, Lines 1-8*).

Conclusion

19. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/James S. Wozniak/
James S. Wozniak
Patent Examiner, Art Unit 2626